



Best Available Copy

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674.903	09/30/2003	Andrea Lorenzo Vitali	851763.441	9001

38106 7590 01/25/2008
SEED INTELLECTUAL PROPERTY LAW GROUP PLLC
701 FIFTH AVENUE, SUITE 5400
SEATTLE, WA 98104-7092

EXAMINER

REKSTAD, ERICK J

ART UNIT	PAPER NUMBER
----------	--------------

2621

MAIL DATE	DELIVERY MODE
-----------	---------------

01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/674,903	Applicant(s) VITALI ET AL.	
	Examiner Erick Rekstad	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 20-43, 45-55 and 58-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 21, 23, 24, 26-40, 46, 48, 49, 51-55 and 58-62 is/are rejected.
- 7) ☒ Claim(s) 16-18, 20, 22, 25, 41-43, 45, 47 and 50 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is a Final Rejection for Application No. 10/674,903 in response to the amendment filed on November 8, 2007.

Response to Arguments

Applicants' arguments filed November 8, 2007 have been fully considered but they are not persuasive.

The Applicants argue the combination of Cho (US Patent 6,463,100) and Maeda (US Patent 5,341,441) does not teach the requirements of amended claim 1 (combination of previous claims 1 and 19). The Applicants specifically argue that Cho does not teach "the value of the quantization step is increased near the edges of said image". The Examiner notes that the previous rejection for claim 19 relies on Maeda for the teaching of the above feature, therefore all arguments related to Cho not teaching the feature are moot.

The Applicants argue that Maeda is silent as to "the value of the quantization step is increased near the edges of said images". As provided in the previous Office Action with respect to the rejection of claim 19, Maeda teaches the above feature on Column 10 Lines 1-20. Applicants have provided no indication as to how the citation does not teach the requirement and therefore it is viewed by the Examiner that the feature is taught by the citation.

The Applicants argue that Maeda does not teach "said vector quantization from repeated application of a scalar quantizer to the pixels of said blocks." Specifically, the Applicants state "the vector quantization is performed on the pixels, without any sort of

prior transformation of the pixels.” It is first noted by the Examiner that claim 1 states “A process, comprising”. As stated in MPEP 2111.03, “comprising” is a transitional phrases that is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. The claim further does not require the repeated application of a scalar quantizer to be performed directly to the pixels of the blocks, as suggested by the Applicants. Thus, Maeda teaches repeated application of a scalar quantizer to the pixels of the blocks indirectly since the quantizer is performed on the transformed blocks. It is further important to note that Maeda suggest an alternative method where the transform operation is not performed, allowing direct application of a scalar quantizer to the pixels (Col 12 Lines 47-57, Fig. 8).

Applicants’ arguments related to claims 26, 51 and 58, rely on the arguments for claim 1. Therefore, the arguments have been responded to based on the above response for claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 13-15, 21, 23, 24, 26-35, 38-40, 46, 48, 49, 51-55, 58-60 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,436,100 to Cho et al. in view of US Patent 5,341,441 to Maeda et al.

[claims 1, 26, 51, and 58]

As shown in Figure 4, Cho teaches a process and system for converting digital video signals organized in blocks of pixels between a first format and a second format, said second format being a format compressed via vector quantization with a quantization step (mquant) determined in an adaptive way according to characteristics of the pixels (Abstract, Col 3 Lines 29-40, Col 8 Lines 47-60, Fig. 3). Cho is silent on the specific operation of the quantizer.

Maeda teaches the use of a vector quantizer for quantizing digital image blocks wherein the quantizer first scalar quantizes the pixel components followed by vector quantizing means (Col 3 Line 65-Col 4 Line 10, Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the quantizer of Maeda with the converting process of Cho in order to provide a quantizer which contains a small look-up table (Col 3 Lines 40-44).

Maeda further teaches the identifying a value of edge sharpness in each of said blocks of pixels, dividing the edges into a number of classes; and attributing values to said quantization step differentiated according to the classes thus determined (Col 10 Lines 1-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the edge detection means of Maeda in order to improve vector quantization efficiency as taught by Maeda (Col 10 Line 20).

In regards to claim 51, Cho teaches the method is an algorithm run by an encoder (Col 1 Lines 7-12 and Lines 18-19).

[claims 2, 27 and 59]

Cho further teaches the quantization step is determined so as to increase according to a lack of uniformity of the pixels in the block (Col 4 Lines 38-50).

[claims 3 and 28]

Cho further teaches wherein said quantization step is determined by a law increasing according to multiples (Col 10 Lines 44-45). Note: Equation 15 shows the step value (m_{quant}) is equal to m_{quant} or $2 * m_{quant}$ based on the Luminance value.

[claims 4, 7, 29, and 32]

Cho further teaches the process according to claim 1 and system according to claim 26, further comprising determining a level brightness of pixels in a block and determining said quantization step in such a way that said quantization step increases as a function of said level of brightness (Col 10 Lines 40-45). Note, as shown above for claim 3 the step value is based on the Luminance value. The equation further use the average luminance as required by claim 7.

[claims 5, 30, and 53]

Cho teaches the process according to claim 1 and system according to claim 26, further comprising:

Detecting a lack of uniformity of the pixels in a block (See claim 2 above)

Detecting a level of brightness of the pixels in the block (See claim 4 above)

Determining said quantization step in such a way that said quantization step first increases and then decreases as a function of said lack of uniformity and said level of brightness (Col 5 Lines 7-16, Fig. 3).

[claims 6 and 31]

Cho further teaches the quantization step is made to increase and decrease by multiples or sub-multiples (Col 8 Lines 32, and Col 10 Line 40-45). Note: Equation 15 teaches the use of multiples while Equation 11 teaches the use of sub-multiples.

[claims 8 and 33]

Cho further teaches the process according to claim 1 and system according to claim 26, wherein in passage from said first format to said second format, said digital video signals are subjected to at least one to one of the following:

Sub-sampling;

Low-pass filtering for anti-aliasing purposes before sub sampling; and
multiplexing of at least one part of digital data necessary for representation of an image (113, in Figure 1). Note: 113 is a multiplexer.

[claims 9, 23, 34, 48, 54 and 60]

Cho teaches the use of image data in the 4:2:0 format as 720x480 ccir image (Col 6 Lines 5-10). Cho is silent on the re-ordering such that the multiplexed chromatic components are quantized separately.

Maeda teaches an alternative embodiment for processing color images (Fig. 2). The images are obtained as RGB data and converted to Luminance (L^*) and chrominance values (a^* and b^*). These values are then processed separately (22, 23, and 24). Maeda further teaches the RGB signal can be converted to YCrCB (Col 17 Lines 50-54). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the quantizer of Maeda with the process of Cho in order to process color images as taught by Maeda (Col 13 Lines 30-34).

[claims 10 and 35]

Cho further teaches the process according to claim 1 and system according to claim 26, further comprising identifying, in a context of said digital video signals, blocks of uniform pixels, choosing for said blocks of uniform pixels a minimum quantization step among quantization steps adopted in said vector quantization (Col 2 Lines 8-9, Col 3 Lines 12-33 and Col 10 Lines 54-56).

[claims 13, 14, 38 and 39]

As shown in Figure 4, Cho teaches in passage from said first format to said second format, the signal compressed via vector quantization is subjected to entropic encoding (112). Cho specifically teaches variable length encoding which is well known in the art to incorporate run-length encoding, Huffman encoding or arithmetic encoding (Official Notice).

[claims 15, 40, 55 and 62]

As shown in Figure 7, Maeda teaches the use of a multi-dimensional vector quantization resulting from concatenation of a plurality of vector quantizations, each resulting from repeated application of a scalar quantization (Col 10 Lines 52-55). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the quantizer of Maeda with the converting process of Cho in order to provide a quantizer which contains a small look-up table (Col 3 Lines 40-44).

[claims 21 and 46]

Cho teaches the process according to claim 4, further comprising: dividing said level of brightness of the pixels in the block in a number of classes; and selecting a

value of said quantization step in a different way according to the classes thus determined (Col 10 Lines 25-51).

[claims 24 and 49]

Cho teaches the use of macroblocks and the processing of the video using the 4:2:0 format (Col 6 Line 8 and 43). Though, Cho teaches the use of MPEG-2 and the 4:2:0 format and it is well known in the art that MPEG-2 processes the macroblock as a luminance block and two chrominance blocks, Cho is silent on specifically teaching the processing of the quantizing of the luminance block. Maeda teaches the vector quantization is applied to adjacent pairs of pixels in a luminance plane (Col 13 Lines 40-42, Fig. 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the quantizer of Maeda with the converting process of Cho in order to provide a quantizer which contains a small look-up table (Col 3 Lines 40-44).

[claim 52]

As shown in Figure 4, the encoder reduces statistical and perceptive redundancy of data (102, 103 and 112).

Claims 11, 12, 36, 37 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cho and Maeda as applied to claims 1, 26 and 61 above, and further in view of US Patent 5,731,836 to Lee.

[claims 11, 12, 36, 37 and 61]

As shown above, Cho and Maeda teach the process of claim 1 and system of claim 26. Cho further teaches the motion compensation steps as shown in Figure 4 (105, 106, 108, 109, 102). Cho is silent on such steps being a DPCM scheme.

Lee teaches a similar motion compensation means as a hybrid DCT/DCPM (Col 1 Lines 13-25, Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention that the motion compensation steps of Cho is a DCPM as suggested by Lee.

Allowable Subject Matter

Claims 16-18, 20, 22, 25, 41-43, 45, 47, 50 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Rekstad whose telephone number is 571-272-7338. The examiner can normally be reached on 8-5.

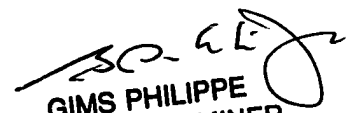
Application/Control Number:
10/674,903
Art Unit: 2621

Page 10

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Erick Rekstad
Examiner
AU 2621
(571) 272-7338
erick.rekstad@uspto.gov



GIMS PHILIPPE
PRIMARY EXAMINER